

## CHEMICALS, CANCERPHOBIA AND COMMUNICATION

By Elizabeth M. Whelan

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I don't think it will come as a big surprise to you if I tell you that Americans today are nervous. They are worried about funny sounding chemicals in our food, water, and air. And it's no wonder people are concerned. In recent months, the popular press has tolled a litany of potential cancer hazards in our environment.

We have heard that hamburgers may cause mutations, that drinking hair dye is no good for us, that saccharin causes cancer in Canadian rats, and that the mild sedative you need to digest all this good news has just been banned. There are some times when I think the only solution is a good stiff drink, as long as it isn't Scotch—or beer. These may cause cancer too!

I think we have become suspicious, and some of us are so jumpy that we are ready to shout "carcinogen" at the merest hint of trouble. Or we are simply fed up with warnings on labels.



But American industry has responded to our concerns. We are now told that if it isn't "natural" it is best avoided. There are natural clothes, natural foods, natural deodorants, and even natural pesticides. And who could forget natural cigarettes with the Surgeon General's warning naturally displayed?

The real issue behind this "natural is better than artificial" puffery is not the fact that there *is* concern, but why these concerns exist and what we can or should do about them.

Cancer is an unquestionably serious public health problem in the United States today. This year an estimated 395,000 Americans will die from some form of cancer, making it the second leading cause of death behind heart disease. So there is an obvious need for a rational and integrated system to identify and assess cancer risks. This is particularly obvious to those in the chemical or chemical-related industry. But there is

im•pri•mis (im-pri-mis) adv. In the first place. Middle English, from Latin *in primis*, among the first (things).

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substantial disagreement today about what the best policy is to adopt.

To a large extent, this controversy arises from widespread public misconceptions of cancer and its causes. These misconceptions influence research and regulatory priorities and in some cases divert limited economic and technical resources. A solution to these problems, then, depends in part on correcting these misconceptions through education and research.

The problem is a complex one, but in an attempt to simplify this discussion, I've identified seven specific areas of cancer misinformation and confusion among the general public. If we are to have any impact on

warrant the word "epidemic." You may recall in 1975, newspapers around the country carried headlines of a cancer epidemic, referring to the possibility that a timebomb was going off. And again, we are back to the implication that as we have developed as a highly technological nation, we have suffered more and more environmentally induced cancer.

Again, however, the popular wisdom does not jibe with the facts. Data from the National Cancer Institute indicate that the overall incidence of cancer (the number of new cases of cancer per 100,000 population) has declined slightly since 1947. There has been an increase in cancer mortality in the past few decades, but



changing our country's current approach to environmental issues, I think it is critical that we first understand—and then proceed to correct—these areas of misunderstanding.

*First*, there is apparently a very poor understanding about the relative prevalence of cancer in the United States. Surveys indicate that many Americans assume we have an unusually high rate of cancer here—the implication being, of course, that we are paying for the benefits of technology with poor health. The premise is so widespread that it has become part of the popular wisdom. A recent network television special opened with the statement, "If you live in the United States, your chances of developing cancer are higher than anywhere else in the world." During his debate with President Ford a few years ago, President Carter informed us we had the highest cancer death rate in the world. And when you hear a statement enough, you tend to believe it, and tend to want to take action on the basis of it. The fact, of course, is that the United States has a cancer death rate which is about average for a developed country. Scotland, this year, holds the dubious honor of being Number 1.

*Second*, the national surveys tell us that people also believe that there is a marked increase in the past few decades in the incidence of cancer—enough so to

certainly nothing on the order of "epidemic." Most interestingly, of course, as you are well aware, only one form of cancer death has increased significantly for all Americans: lung cancer. At a time when American eaters are particularly nervous about chemicals in their food, it is again ironic to note that paralleling the dramatic increase in lung cancer, we've been witnessing a precipitous decline in gastric cancer.

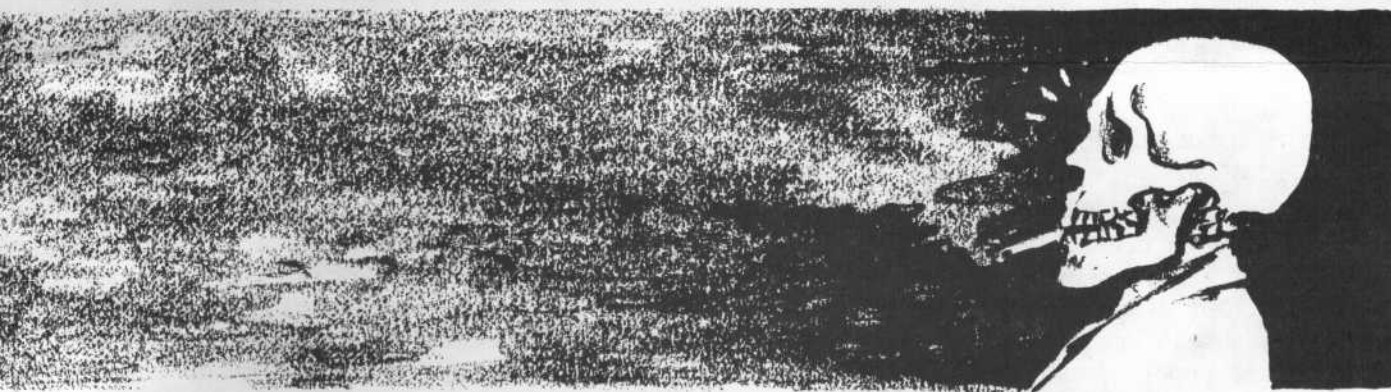
*Third*, it's common cocktail party chatter these days to acknowledge that 90% of cancers are caused by factors in the environment. And of course to most laymen, this conjures up the image of a white-coated evil scientist pouring carcinogens into the air, water, food and workplace. The origin of the 90% figure was an estimate made by an epidemiologist affiliated with the World Health Organization, who compared international cancer rates by site and concluded that simply being human did not explain the majority of cancers, that differences between countries had to be accounted for by different factors in the environment. In making this estimate he was not referring to "chemicals" around us, but rather primarily to differences in lifestyle factors.

Estimates among epidemiologists now vary somewhat, but there is a general consensus that 40% of the cancers occurring today in American men are caused by

one specific environmental factor—tobacco (25% in women). Additionally, there is a strong suggestion that some aspect of nutrition and diet plays a major role in the development of certain cancers—colon, breast, prostate and stomach, perhaps, accounting for one-third of all these diseases. At this point we simply do not have the answer here, but feel that it is some component of the general diet. And there are some other contributors to environmental cancer: excessive alcohol use, especially in conjunction with cigarette smoking, accounts for a substantial number of oral cancers. A few drugs—most dramatically, DES—have been shown to increase cancer risk. Differences in sexual and reproductive patterns influence risks of cervical and

ing these tumors as something else, or there is some unknown factor that is delaying their detection. But one thing we do know, there is a vast amount of difference between the 20 to 40 percent HEW estimate and the 1 to 5 percent estimates of the International Agency for Research on Cancer and another project that reached the same conclusion in a study of the British work force.

There is, however, one point which the HEW paper discussed that I believe has some merit. And that is that we might be misleading ourselves by trying to affix the blame for "X" percentage of cancers to a single chemical or process. The multifactorial nature of cancer



breast cancers. Excessive exposure to radiation—background or manmade—has accounted for some of the environmental cancer toll. And of course in some specific instances, exposure to occupational chemicals or conditions have led to increased risk of cancer of a number of sites.

But getting back to perspective, the vast majority of that 80-90% environmental cancer figure is accounted for by tobacco, and the still undefined contribution of diet. The other factors explain only a relatively small amount of cancer mortality in this country. Although there has been considerable controversy about the subject in recent months, it still appears that well under 5% of cancer mortality can be related to occupational carcinogens.

I'd like to emphasize that there is no question that a number of industrial chemicals carry potential cancer risks. There is also no question that among them asbestos contributes the greatest risk in terms of exposed populations and widespread use. But if we were to believe Califano's estimate, there should be an astronomical increase in the number of mesotheliomas, the rare lung cancer almost exclusively related to asbestos. Yet in those states with tumor registries, like New York and Connecticut, these projected increases have not been detected. Perhaps doctors are still misclassify-

seems to argue against this approach. We know, for example, that asbestos is a cancer risk, and we also know that cigarette smoking increases this risk by at least one order of magnitude. Yet I find it ironic, indeed, to read that a recent court decision declared that a company policy to hire only non-smokers for work with asbestos is discriminatory. It appears that the court has decided that it is better for the company to risk going out of business to comply with regulatory procedures than to deny a worker the right to kill himself by smoking.

But the idea that we should consider the interaction of risk factors in a broader perspective is a reasonable one.

*Fourth*, on our list of common misconceptions about cancer—and related to the one I've just discussed—is the idea that it is industry, particularly the chemical and manufacturing industries, that causes cancer. Under this misdirected reasoning, one concludes that not only do asbestos and vinyl chloride cause cancer in workers, but also become part of a general polluted environment and cause cancer in the residents of the community as well. A case in point here is the state of New Jersey. Back East they call it "cancer alley," and the recommendation is not to live there—and if you must drive through, hold your breath. If you ask a passerby why



he cancer rate is so high in New Jersey, he will tell you, "the chemical industries. That's the price I have to pay to live here."

Actually, however, I have never seen convincing evidence to suggest that general air pollution increases the risk of human cancer. Certainly there are other health and aesthetic reasons for cleaning up our air. But again, the popular misconception about cancer does not jibe with the facts. A careful analysis of the statistics in a state such as New Jersey reveals that it has no different cancer pattern than any other urban area. Of interest to some might be the fact that the lung cancer death rate in some of the more polluted areas of New Jersey is about the same as it is in Rutland, Vermont where the major industry is tourism.

*Fifth* on my list of points of concern and misinformation is the general concept of the word "risk." When it comes to discussions of cancer and the environment, most Americans have a very poor concept of the nature of the risks we are speaking of. The problem here is twofold: first, extrapolating from one tragic circumstance to all uses of the substance. Thus a poor understanding of risk assessment might make one conclude that if large amounts of inhaled asbestos increased risks among workers of mesothelioma, and if they smoked cigarettes, of lung cancer, then we should tolerate no exposure to asbestos in the future, no matter how minute the quantities may be and no matter what the cost, in terms of prices and availability of goods, that this reduction would entail.

The second manifestation of public confusion about risk relates to an apparent inability to distinguish between real and hypothetical risks. A real risk is something you can identify and quantitate, then either accept or reject. Driving a car and flying in an airplane involve risks. People die. At the end of each year we know exactly what the risks of 12 months of use of these conveniences were. Americans appear to have little trouble accepting these real risks. Similarly, cigarettes pose a known health hazard. Epidemiological studies allow calculations of personal risk assumed here. These are real risks. The use of food additives, pesticides and low level exposures to occupational chemicals, on the other hand, pose hypothetical risks. Of course it is possible that they contribute to cancer mortality, but we have no evidence at this point that they do. As a society we seem to be drifting toward a policy which tolerates known, major risks chosen by the individual—and rejects hypothetical risks that might be assumed by industry or society as a whole. This was clear to me this fall in New York when nearly a quarter million individuals gathered to protest nuclear power. The newsclippings I saw revealed that a significant number of them were smoking cigarettes.

*Sixth*, cancerphobia in America and the dozens of environmental regulations which have stemmed from it

are very much tied in to what seems to be a new philosophy about cause of disease. If indeed there is one classical attitude about human disease and its causes, it is one based on the assumption that most diseases are unexplainably caused by "bad spirits," "bad air" or simply God's will. Diseases, until recently, just happened. But not so today. Instead, now, we are either guilty or angry when someone close to us becomes ill.

An associate of mine was recently diagnosed as having kidney cancer. For three weeks he asked me the same questions: "What caused it? Why me? What did I do wrong? Who's fault was it?" The conversations we have had have been tragically frustrating, with my answer always the same: "We have no information on what causes kidney cancer. We simply don't know."

He has posed the same question repeatedly to his physician. Last week the doctor gave in to his pleadings, telling my friend that his use of saccharin might be the cause. Presumably the physician knows that even the darkest picture ever drawn on the issue of saccharin's safety has never implicated the sweetener as a cause of kidney cancer. But the doctor was attempting to fulfill a need; my friend desperately wanted to identify a cause and the saccharin explanation satisfied him, allowing him to place the blame somewhere: on the saccharin manufacturers and on himself for using it.

My associate's experience is, I believe, characteristic of a major change in attitude we've noted during the 1970's, and one which resulted from our new emphasis on cancer and the environment and which has major implications for our economy and standard of living.

While I was a guest on a Chicago talk show last month, a woman called in to tell me her four-year old son had leukemia. "I know the cause," she told me sadly, "I breast fed him, and my milk was contaminated with DDT. We really have got to ban those pesticides to stop this cancer epidemic."

This woman's reaction reminded me of an incident which occurred in New Jersey three years ago: two women from the Bergen County town of Rutherford whose sons had died from leukemia within five months of each other began a personal search for other such cancer deaths. They found a number more, and notified the press that they had identified the "cause" of their children's disease: pollution from the chemical companies in the state. They demanded that some major industries in their neighborhood be closed down. Media coverage of the "cancer cluster" was extensive. Follow-up coverage on the findings of the State Health Department that the frequency of cancer deaths in Rutherford was no more than that expected in any population that size was minimal. In many people's minds the "cause" of those leukemia cases is still the New Jersey chemical industry, although the sobering reality is that we do not know the cause of the over-

whelming majority of childhood leukemia cases.

A number of months ago in Oregon a group of 14 women who had suffered a miscarriage or had a child with a birth defect banded together to announce they knew the "cause" of their problem: their area had been sprayed over the past few years with the herbicide 2,4,5,T. As a direct result of their announcement, the herbicide was banned, this despite the fact that follow-up reports noted that the miscarriages and birth defects in question occurred in a random manner with no obvious clustering within a few months after the spraying. But again, the "cause" of reproductive problems remains in many minds, and again, we simply do not know the real cause of all miscarriages and birth defects.

Similarly, Vietnam veterans who now find they have cancer—or children with birth defects—are claiming that this same herbicide, used to defoliate the jungles during the war, is the cause of their problems. And again, the scientific evidence to back up their claims is nonexistent.

In New York City, policemen and firemen have succeeded in passing the so-called "heart bill" which compensates them for any expenses related to the development of heart disease. The assumption here is, of course, that the "cause" of heart disease among these two groups of employees is job stress, and thus the general population of the state should assume all the costs. Actually, however, there is no evidence that "stress" itself is a factor in etiology of heart disease and if, indeed, policemen and firemen do have a higher rate of heart disease than the rest of the New York male population, it is likely to be due to differences in exposure to one established causative factor, cigarette smoking.

We have come a very long way in understanding some of the causative factors in today's major killers. For example, as I've mentioned, we know that cigarette smoking contributes to the causation of one-third of all this year's cancer deaths; that, while the causation of heart disease is complex, cigarette smoking, high blood pressure, high serum cholesterol are clearly the top three risk factors; that excessive consumption of alcohol increases one's risk of liver and other diseases; that exposure to some occupational chemicals, like asbestos and vinyl chloride, raises cancer risks.

But the fact remains that we simply do not have all the answers. Diseases, and deaths, still occur for reasons unknown to us. Human beings remain mortal. Death and diseases are still natural processes. It is unconstructive to blame ourselves in these instances. And it is economically disastrous for a society when there is no proof of guilt.

*Seventh*, and finally, the cancerphobia which now grips our nation and is dictating federal policy in a number of government agencies seems to be largely

traceable to a fear of chemicals. A chemical anxiety. A chemical reaction. Are we eating too many chemicals? Are there too many chemicals in our environment? I met a woman in the supermarket the other day who asked me to help her read the label on a box of egg beaters, the low cholesterol egg substitute. I complied only to have her exclaim, "My goodness, all that aluminum sulfate, sodium and triethyl citrate and emulsifiers. I'd rather keep my cholesterol high than become a walking test tube." Little did she know that the natural organic egg, even if it is laid by a happy hen, contains among other things ovalbumin, conalbumin, globulins, fatty acetic and butyric acids.

The suspicion over artificial chemicals and complacency over natural ones is silly but seems to be a basis for cancer-chemical phobia. Thus a housewife gets upset about the use of a synthetic estrogen DES sometimes used to stimulate cattle growth and keep prices down, because traces of it have been found in some 5 percent or less of beef livers, and she hears that DES causes cancer. What she doesn't know perhaps is that any estrogen natural or otherwise in high doses will cause cancer, that her body regularly produces it, and that there is 1000 times the amount of estrogen in a single egg than in a serving of affected liver.

Enough said here. The anxiety, the fear of cancer and its relationship to the environment may be peaking. But misinformation on cancer still abounds. And as it does, and as it directs the policies at the Food and Drug Administration, the Environmental Protection Agency, the Occupational Safety and Health Administration and elsewhere, we are all suffering. For businessmen, the implications are clear: more regulation, higher costs, fewer jobs, and limited production. For me as a scientist and consumer the implications are also clear: high prices, higher taxes, fewer products—a diminished standard of living.

When a pesticide is banned, it may make the environmentalists feel good, make them think they are doing something. But as an epidemiologist, I know it is not preventing cancer. And as a consumer it makes me angry that even though the banning has no medical benefits, it means that I will pay more for strawberries and corn next year. Such bannings also serve as a disincentive to an industry that could eventually come up with an even better pesticide—which would help us produce more food, for ourselves and the world.

When a food additive is banned, it makes some of the Naderite groups happy, and the government content. But as a scientist I know that, too, will not prevent cancer, but will only serve to remove useful products from the shelves, such as diet soft drinks.

When OSHA passes carcinogen standards requiring strict regulation of any occupational chemicals that might cause cancer in laboratory animals, this does not prevent human cancer. That goal could be accom-

plished effectively and efficiently by giving individual attention to known carcinogens. But what it will mean is that you and I will be paying double or triple for drycleaning in the next few years.

All of us are consumers. All of us are in favor of good health. If a chemical or processing technique, or any other aspect of our environment, threatens our health, we would all be in favor of restricting or curtailing its use. But what a growing number of us are not in favor of is the passage of laws and regulations that do not protect our health and only serve to remove useful things from the market and raise the prices of those that do remain.

What we need, of course, is a new breed of consumer advocate, one who can effectively explode the myth that we have to choose between modern technology and good health. We can have both. Of course we need to keep health-threatening chemicals out of our food, air and water. However, with today's consumer advocates leading the show, we are heading toward not only zero risk, but zero food, zero jobs, zero energy and zero growth.

What can we do about changing this state of affairs? How can we become new consumer advocates? One of the most effective ways, in my view, of challenging the popular wisdom is to speak out. Companies and consumer groups alike. When you see or hear some "fact" reported in the popular press, voice your objections. Tell people there is another side to the story.

For executives in the chemical industry, the burden falls particularly hard, because they are most familiar with the relationship between chemicals and our environment. Some companies, like Monsanto and General Foods, have already taken the initiative in this public education concept.

An additional approach is to support those scientific groups which are promoting balance rather than extremism. The American Council on Science and Health is one such organization that is trying to restore a little more common sense to our public health policies. We at the American Council are equipped to counter much of the misinformation about chemicals and health. We have provided reputable scientists to appear on TV and radio to offer moderating views on some of the more controversial issues. We issue detailed research papers and position statements on such topics as saccharin, cancer in the U.S., hyperactivity, food additives, and others. We participate in Congressional hearings and regulatory procedures to present the views of scientists who do not share the ban-everything philosophy.

I would urge you all to take a more active role in the public information process, both as individual consumers and as representatives of industry. And once this participation has increased, I believe that many Americans will see that it is the prophets of doom, not the profits of industry, that are the real hazards to our health.

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